

IN THE CLAIMS

✓ Please make the following claim substitutions:

1 1. (Currently amended) A system for bi-directional transmission of
2 optical signals over a single optical medium coupled between at least two nodes,
3 said system utilizing a first optical transmission band for signals traveling in a first
4 direction and a second optical transmission band for signals traveling in a second
5 direction, said system comprising:

6 at least a first combiner/separator unit at a first of said two nodes, said first
7 combiner/separator including an input port, an output port and a bi-directional
8 input/output port for coupling to said single optical medium, a first optical filter
9 within said first combiner/separator unit coupled to each of said ports therein,
10 said first optical filter being substantially transmissive to optical signals of said
11 first band entering said input port and exiting on said bi-directional input/output
12 port and said first optical filter being substantially reflective for signals of said
13 second band entering said bi-directional input/output port and exiting on said
14 output port; and

15 at least a second combiner/separator unit at a second of said two nodes,
16 said second combiner/separator including an input port, an output port and a bi-
17 directional input/output port coupled to said optical medium, a second optical
18 filter within said second combiner/separator unit coupled to each of said ports
19 therein of said second combiner /separator unit, said second optical filter being
20 substantially transmissive to optical signals of said second band entering said
21 input port and exiting on said bi-directional input/output port and said second
22 optical filter being substantially reflective for signals of said first band entering
23 said bi-directional input output port and exiting on said single direction output
24 port,

25 wherein said first optical filter and said second optical filter are in an
26 alternating arrangement.

1 2. (Original) The system of Claim 1, further including at least one
2 intermediate node, said intermediate node comprising:

3 at least one said first combiner/separator unit and at least one second
4 combiner/separator unit, and

5 at least a first and second optical amplifier, said output port of said first
6 combiner/separator unit coupled to said input port of said second
7 combiner/separator unit through said first optical amplifier, said output port of
8 said second combiner/separator unit coupled to said input port of said first
9 combiner/separator unit through said second optical amplifier;

10 said first and second combiner/separator units being alternately coupled
11 within said bi-directional transmission system such that pairs of said first and
12 second combiner/separator units are utilized in combination, said bi-directional
13 ports of said combiner/separator units being coupled to one another.

1 3. (Original) The system of Claim 1, wherein said optical transmission
2 bands are L-band and C-band.

1 4. (Currently amended) The system of Claim 1, wherein said first node
2 includes a first set of one or more optical translator units for translating received
3 wavelengths to wavelengths of said first transmission band, said optical
4 translator units being coupled to an optical multiplexer unit and said optical
5 multiplexer unit being coupled to said input port of said first combiner/separator
6 unit;

7 said output port of said first combiner/separator unit coupled to an optical
8 demultiplexer unit, said optical demultiplexer unit coupled to a second set of
9 optical translator units for translating wavelengths of said second transmission
10 band to said received wavelengths.

1 5. (Original) The system of Claim 4, wherein said first node further
2 includes at least one optical amplifier coupled between an output of said
3 multiplexer and said input port of said first combiner/separator unit and at least
4 one optical amplifier coupled between said output port of said first
5 combiner/separator unit and an input of said demultiplexer.

1 6. (Original) The system of Claim 1, wherein said second node includes a
2 first set of one or more optical translator units for translating received

3 wavelengths to wavelengths of said second transmission band, said optical
4 translator units being coupled to an optical multiplexer unit and said optical
5 multiplexer unit being coupled to said input port of said second
6 combiner/separator unit;

7 said output port of said second combiner/separator unit coupled to an
8 optical demultiplexer unit, said optical demultiplexer unit coupled to a second set
9 of optical translator units for translating wavelengths of said first transmission
10 band to said received wavelengths.

1 *BB*
2 7. (Original) The system of Claim 6, wherein said second node further
3 includes at least one optical amplifier coupled between an output of said
4 multiplexer and the input port of said second combiner/separator unit and at least
5 one optical amplifier coupled between said output port of said
combiner/separator unit and an input of said demultiplexer.

1 8. (Original) The system of Claim 1, wherein said filters included in each
2 of said first and second combiner/separator units are thin film wide-band filters.

1 9. (Currently amended) The system of Claim 3, wherein said C-band
2 and L-band filters include a transmissive insertion loss in the range of 1.3 to 1.7
3 dB and reflective insertion loss in the range of 0.3 to 0.9 dB.

1 10. (Canceled)

1 11. (Canceled)

1 12. (Currently amended) A system for bi-directional transmission of optical
2 signals over a single optical fiber, said system including at least two nodes
3 having said optical fiber coupled therebetween, said system utilizing only two
4 distinct optical transmission bands, a single one of said bands for transmission of
5 said optical signals in one of two directions, the other of said bands for
6 transmission of said optical signals in the opposite direction, said system
7 comprising:

8 at least a first and second combiner/separator unit, at least one
9 combiner/separator unit located at each of said two nodes, each said

10 combiner/separator unit including an input port, an output port and a bi-
11 directional input/output port for coupling to said single optical fiber, an optical
12 filter within said combiner/separator units coupled to each of said ports, each
13 said combiner/separator unit operable to direct optical signals entering said input
14 port through said optical filter to said bi-directional input/output port and to reflect
15 optical signals entering said bi-directional input/output port off of said optical filter
16 to said output port;

17 said optical filter in said first combiner/separator unit being substantially
18 transmissive to a first of said two bands and substantially reflective to optical
19 signals in said second band traveling in an opposite direction;

20 said optical filter in said second combiner/separator unit being
21 substantially transmissive to signals in said second band and substantially
22 reflective for signals of said first band traveling in an opposite direction; and

23 said first and second combiner/separator units being alternately coupled
24 within said bi-directional transmission system such that pairs of said first and
25 second combiner/separator units are utilized in combination, said bi-directional
26 ports of said combiner/separator units being coupled to one another,

27 wherein said optical filter in said first combiner/separator unit and said
28 optical filter in said second combiner/separator unit are in an alternating
29 arrangement.

1 13. (Original) The system of Claim 12, further including at least one
2 intermediate node, said intermediate node comprising:

3 at least one said first combiner/separator unit and at least one second
4 combiner/separator unit, and

5 at least a first and second optical amplifier, said output port of said first
6 combiner/separator unit coupled to said input port of said second
7 combiner/separator unit through said first optical amplifier, said output port of
8 said second combiner/separator unit coupled to said input port of said first
9 combiner/separator unit through said second optical amplifier.

1 14. (Original) The system of Claim 12, wherein an end node in said
2 system includes either a first or second combiner/separator unit, said end node

3 further including a first set of one or more optical translator units for translating
4 received wavelengths to wavelengths of one of said two distinct transmission
5 bands, said optical translator units being coupled to an optical multiplexer unit
6 and said optical multiplexer unit being coupled to said input port of said
7 combiner/separator unit; and

8 said output port of said combiner/separator unit coupled to an optical
9 demultiplexer unit, said optical demultiplexer unit coupled to a second set of
10 optical translator units for translating wavelengths of said other of said two
11 transmission bands to said received wavelengths.

1 15. (Original) The system of Claim 14, wherein said end node further
2 includes at least one optical amplifier coupled between an output of said
3 multiplexer and the input port of said combiner/separator unit and at least one
4 optical amplifier coupled between said output port of said combiner/separator unit
5 and an input of said demultiplexer.

1 16. (Original) The system of Claim 12, wherein said filters included in each
2 of said first and second combiner/separator units are thin film wide-band filters.

1 17. (Canceled)

1 18. (Original) The system of Claim 12, wherein said transmission bands
2 are selected from the group consisting of L-band/C-band, C-band/S-band, C1
3 band/C2 band and S-band/L-band.

1 19. (Canceled)

1 20. (Canceled)

1 21. (Currently amended) A method for bi-directional transmission of optical
2 signals over a single optical fiber coupled between two nodes, said method
3 utilizing only two distinct optical transmission bands, a single one of said bands
4 for transmission of said optical signals in one of two directions, the other of said
5 bands for transmission of said optical signals in the opposite direction, said
6 method comprising:

7 providing at least a first and second combiner/separator unit, at least one
8 combiner/separator unit located at each of said two nodes, said
9 combiner/separator units each including an input port, an output port and a bi-
10 directional input/output port for coupling to said single optical fiber, an optical
11 filter within said combiner/separator units coupled to each of said ports, each of
12 said combiner separator units operable to direct optical signals entering said
13 input port through said optical filter to said bi-directional input/output port and to
14 reflect optical signals entering said bi-directional input/output port off of said
15 optical filter to said output port,

16 said optical filter in said first combiner/separator unit being substantially
17 transmissive to a first of said two bands and substantially reflective to optical
18 signals in said second band traveling in an opposite direction,

19 said optical filter in said second combiner/separator unit being
20 substantially transmissive to signals in said second band and substantially
21 reflective for signals of said first band traveling in an opposite direction; and

22 alternately coupling said first and second combiner/separator units within
23 said bi-directional transmission system such that pairs of said first and second
24 combiner/separator units are utilized in combination, said bi-directional ports of
25 said combiner/separator units being coupled to one another,

26 wherein said optical filter in said first combiner/separator unit and said
27 optical filter in said second combiner/separator unit are in an alternating
28 arrangement.

1 22. (Currently amended) The method of Claim 49 21, wherein said
2 transmission bands are selected from the group consisting of: L-band/C-band, C-
3 band/S-band, C1 band/C2 band and S-band/L-band.

1 23. (Currently amended) Apparatus, comprising:

2 means for filtering, and

3 means for transmitting a first signal in a first signal band from a first path
4 onto an optical medium via said means for filtering, said means for filtering being
5 substantially transmissive to signals in said first signal band and substantially

6 reflective to reflecting a second signals in a second signal band received from
7 said optical medium onto a path separate from said first path.

8 wherein said means for filtering is adapted to be coupled in an alternating
9 arrangement to a second means for filtering, said second means for filtering
10 being substantially transmissive to said signals in said second signal band and
11 substantially reflective to said signals in said first signal band.

1 24. (Previously presently) The apparatus of Claim 23, wherein one of
2 said first and second signals is a C-band signal and the other is an L-band signal.

1 25. (Previously presently) The apparatus of Claim 23, wherein the
2 means for transmitting said first signal comprises:

3 means for modulating, multiplexing, and amplifying a plurality of input
4 signals to form said first signal, and

5 wherein said apparatus further connects to said optical medium.

1 26. (Previously presently) The apparatus of Claim 25, further comprising
2 means for amplifying, demultiplexing, and demodulating said second signal.

1 27. (Previously presently) The apparatus of Claim 26, wherein the
2 means for filtering comprises:

3 an input port for receiving said first signal from said first path,

4 a bi-directional input/output port for applying said first signal to said optical
5 medium and for receiving said second signal from said optical medium, and

6 a reflection port for applying said second signal to said separate path.

1 28. (Currently amended) Apparatus for use in a communication system
2 of a type in which optical signals in ~~one~~ a first signal band are transported in one
3 direction along an optical transport medium and signals in a second signal band
4 are transported in the opposite direction of said optical transport medium, said
5 apparatus comprising:

6 a first signal path,

7 a second signal path, different from said first path, and

8 an optical filter that allows the signals traveling in said one direction to flow
9 from said first path onto said transport medium and that reflects the signals
10 traveling in said opposite direction onto said second path,

11 wherein said optical filter is adapted to be coupled in an alternating
12 arrangement to a second optical filter, said second optical filter allows said
13 signals in said second signal band to flow onto said transport medium and
14 reflects said signals in said first signal band.

1 29. (Currently amended) The invention apparatus of Claim 28 wherein:
2 said first signal path includes means for multiplexing and amplifying a
3 plurality of input signals to form said signals traveling in said one direction,
4 said signals traveling in said opposite direction include a plurality of
5 multiplexed incoming signals, and
6 said second signal path includes means for demultiplexing and amplifying
7 said multiplexed incoming signals.

1 30. (Currently amended) The invention apparatus of Claim 29, wherein
2 one of said signal bands is the C band and the other of said signal bands is the L
3 band.

1 31. (New) The system of Claim 18, wherein said C-band and L-band filters
2 include a transmissive insertion loss in the range of 1.3 to 1.7 dB and reflective
3 insertion loss in the range of 0.3 to 0.9 dB.